UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,328	09/16/2003	Steven Shrader	DENAP001	3787

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EXAMINER
STIGLIC, RYAN M

ART UNIT	PAPER NUMBER
2112	

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-21_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _1-21_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _16 September 2003_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-21 are pending and have been examined.

2.   Claims 1-21 are rejected.

Drawings

3.   The drawings are objected to because Figures 1-9 are informal. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5.   Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 11 recites "a dynamic random access memory (DRAM) command arbitration module" but provides a brief recitation of the system of the instant application possessing such a feature. The specification provides no functional definition of a DRAM command arbitration module such that one of ordinary skill in the art would be able to make and/or use the invention.

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7.   Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 eludes to a fact that a the number of adders associated with a port determines a size of the reporting window, however claim 13 strictly defines only a single adder may be associated with each port.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9.   Claim 1-8 and 15-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Kahn et

al. (US006662278B1).

Regarding claim 1, Kahn discloses A method for arbitrating across multiple ports, comprising:

assigning a bandwidth limit over a time period to a port associated with a multi-port controller

(Fig. 2, 212; col. 4, ll. 8-16); receiving data over the port from a requestor (memory accesses;

col. 4, ll. 25-28); determining an amount of bandwidth a requester has previously used (col. 4, ll.

21-28; Fig. 4, 404); comparing the amount of bandwidth to the bandwidth limit (Fig. 4, 406); if

the amount of bandwidth is greater than the bandwidth limit, then the method includes, denying

access to the port for the period (col. 2, ll. 46-48; the invention also denies access by reducing

the number of allowed accesses col. 3, ll. 44-48; also col. 5, ll. 59-67).

Regarding claim 2, the method of claim 1, further comprising: if the amount of bandwidth is less

than or equal to the bandwidth limit, then the method includes, allowing access to the port (col.

3, ll. 48-52).

Regarding claim 3, the method of claim 1, wherein the method operation of determining an

amount of bandwidth a requestor has previously used includes, determining a number of cycles

that commands associated with the port are active over a time period (col. 4, ll. 21-28).

Regarding claim 4, the method of claim 1, wherein the method operation of comparing the

amount of bandwidth to the bandwidth limit includes, defining a statistics window (Fig. 1, 102;

col. 3, ll. 18-20); defining a reporting window within the statistics window (Fig. 1, 106; col. 3,

line 28); and determining whether active use of the port during the reporting window exceeds

the bandwidth limit (col. 4, ll. 3-28).

Regarding claim 5,

The method of claim 4, wherein the statistics window is a period of time that statistics are

gathered (Fig. 1, 102; col. 3, ll. 18-20).

Regarding claim 6, the method of claim 4, wherein the reporting window is a time interval that

statistics are updated (Fig. 1, 106; col. 3, ll. 28-52; also col. 3, ll. 10-13;).

Regarding claim 7, the method of claim 5, wherein the statistics are bandwidth statistics (col. 4,

ll. 21-28).

Regarding claim 8, the method of claim 1, wherein the method operation of determining an

amount of bandwidth a requestor has previously used includes, incrementing a counter

associated with the port when the port is active (col. 4, ll. 3-28).

Regarding claim 15, A system, comprising: a memory controller configured to accommodate a

multi-port design, the memory controller including, an initiator block configured to arbitrate

multiple requests for access to the system, the initiator block including (Fig. 2, 208; col. 4, ll. 3-

28), circuitry configured to define a statistics window (Fig. 1, 102; col. 3, ll. 18-20); and

circuitry configured to define a reporting window, the reporting window being a segment of the

statistics window (Fig. 1, 106; col. 3, line 28), wherein the circuitry configured to define a

statistics window and the circuitry configured to define a reporting window are further

configured to determine a number of cycles that commands for a port are active in the memory

controller over a specified number of cycles (col. 4, ll. 21-28).

Regarding claim 16, the system of claim 15, wherein the statistics window is a period of time

that bandwidth statistics are gathered (Fig. 1, 102; col. 3, ll. 18-20).

Regarding claim 17, the system of claim 15, wherein the reporting window is a period of time

between an update of bandwidth statistics (Fig. 1, 106; col. 3, ll. 28-52; also col. 3, ll. 10-13;).

Regarding claim 18, the system of claim 15, further comprising: a programmable register

configured to store a bandwidth requirement value and a priority value (col. 4, ll. 8-28; Fig. 2,

212).

Regarding claim 19, the system of claim 18, wherein an output associated with both the circuitry

configured to define a statistics window and the circuitry configured to define a reporting

window indicates a bandwidth utilization value for the port (col. 4, ll. 21-28).

Regarding claim 20, the system of claim 19, further comprising: circuitry configured to compare

the bandwidth utilization value with a bandwidth limit value, wherein if the bandwidth utilization

value is greater than the bandwidth limit value, access to the port is denied (col. 2, ll. 46-48; the

invention also denies access by reducing the number of allowed accesses col. 3, ll. 44-48; also

col. 5, ll. 59-67).

10.   Claims 9, 10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being obvious over

applicant's admitted prior art in view of Kahn et al. (US006662278B1).

Regarding claim 9, Applicant's admitted prior art teaches A memory controller (Fig. 1)

comprising: an initiator block configured to arbitrate requests corresponding to data from

multiple ports, the initiator block including, an arbitration module (Fig. 1, 100; paragraph

[0002]); a state machine (Fig. 2, 104) in communication with the arbitration module (Fig. 1,

114; paragraph [0002]), the state machine configured to generate a signal to the arbitration module (Fig. 1, 114; paragraph [0002]).

Kahn teaches a method and system for arbitrating across multiple ports, comprising: assigning a bandwidth limit over a time period to a port associated with a multi-port controller (Fig. 2, 212; col. 4, ll. 8-16); receiving data over the port from a requestor (memory accesses; col. 4, ll. 25-28); determining an amount of bandwidth a requester has previously used (col. 4, ll. 21-28; Fig. 4, 404); comparing the amount of bandwidth to the bandwidth limit (Fig. 4, 406); if the amount of bandwidth is greater than the bandwidth limit, then the method includes, denying access to the port for the period (col. 2, ll. 46-48; the invention also denies access by reducing the number of allowed accesses col. 3, ll. 44-48; also col. 5, ll. 59-67). As is apparent the invention of Kahn teaches a task status and completion circuitry configured to calculated a bandwidth factor based upon previous data selected from the port. The task status and completion circuitry of Kahn supplies this data to a state machine (not expressly stated but implied in-order to adhere to the flow chart of Fig. 4; furthermore Kahn states their invention includes state machines [col. 8, ll. 33-53]) of applicant's admitted prior art such that port access is granted or denied on the basis of the bandwidth factor.

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to implement the adaptive memory access throttling of Kahn into the memory controller of the applicant's admitted prior art such that memory access bursts are smoothed out thus stabilizing memory bus bandwidth.

Regarding claim 10, the memory controller of claim 9, wherein the arbitration module includes a multiplexer, the multiplexer configured to select data from one of the multiple ports (Fig. 1, 102 of applicant's admitted prior art).

Regarding claim 12, the memory controller of claim 9, wherein the task status and completion circuitry includes, a queue configured to indicate remaining bandwidth available for a system associated with the memory controller (Kahn; col. 4, ll. 3-28; Fig. 2, register 212).

Regarding claim 13, the memory controller of claim 9, wherein the task status and completion circuitry includes, an adder associated with each of the multiple ports (Kahn; col. 4, ll. 3-28; Fig. 2, 216).

11.   Claim 21 is rejected under 35 U.S.C. 103(a) as being obvious over Kahn et al. (US006662278B1) as applied to claim 15 above and further in view of what was well known in the art as evidenced by Betker et al. (US006092186A).

In light of the teachings of Kahn above, OFFICIAL NOTICE is taken in that cellular telephones with memory controllers are well known in the art as evidenced by Betker et al. (US006092186A) (col. 3, line 59 – col. 4, line 18; memory controller 18 of Fig. 1). Furthermore, it would have been obvious to incorporate the memory controller of Kahn into a cellular phone in

order to reduce power consumption and temperature through means of bandwidth throttling of memory accesses.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as it is related to Memory Controllers and bandwidth assignment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan M. Stiglic whose telephone number is 571.272.3641. The examiner can normally be reached on Monday - Friday (6:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen can be reached on 571.272.3676. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PAUL R. MYERS
PRIMARY EXAMINER

RMS